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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/057,183	01/23/2002	Hideki Kobayashi	B-4474-619476-8	5314
36716	7590	04/11/2005	EXAMINER	
LADAS & PARRY 5670 WILSHIRE BOULEVARD, SUITE 2100 LOS ANGELES, CA 90036-5679			PANWALKAR, VINEETA S	
			ART UNIT	PAPER NUMBER
			2631	

DATE MAILED: 04/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/057,183	KOBAYASHI ET AL.	
	Examiner	Art Unit	
	Vineeta S. Panwalkar	2631	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 23 January 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 January 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

1. Drawings are objected to as to minor informalities.

Element 17 in Fig. 1 should be relabeled as "Demodulator" because in the "Description of the Preferred Embodiments" on Page 8, Paragraph 2, the applicants refer to unit 17 as a demodulation unit.

Priority

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1- 6 and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Bliss et al. (US 5966415), hereafter referred to as Bliss.

Regarding claim 1, Bliss discloses an adaptive equalization for a disk storage system comprising:

- A conversion device of sampling a signal according to a sampling clock and converting the signal to a sample-value series (Column 2, lines 45-48 and unit 24 in Fig. 4A);
- A phase-correction device of correcting the sample-value series according to a phase-error signal and a phase-detection device of detecting the phase-error signal of the sample-value series whose phase has been corrected (Column 3, lines 54-60 and unit 126 in Fig. 4A);
- A clock generation device of generating the sampling clock for synchronizing said sample-value series according to said phase-error signal (Column 7, lines 44-47 and unit 114 in Fig. 4A).

Regarding claim 2, Bliss meets the subject matter of claim 1 and further discloses a system wherein:

- A phase-correction device that is provided with a transversal filter having a plurality of taps. (Column 4, lines 48-59, where the FIR filter is the transversal filter and the filter coefficients are the required taps. See Fig. 6).

Regarding claim 3, Bliss discloses a system comprising:

- A transversal filter that uses a transfer function that is symmetrical around the center position for performing the filtering operation, and sets tap coefficients according to said phase-error signal. (Column 4, lines 48-59, where the adaptive algorithm performs the selection of taps based on error signal; Column 14, lines 47-51, where the 3-tap filter has tap coefficients that are symmetrical around a center tap, implying a symmetrical transfer function).

Regarding claim 4, Bliss discloses a system comprising:

- A transversal filter that uses a transfer function that is symmetrical around the center position for performing the filtering operation, and selectively switches the connection of the plurality of taps according to the phase-error signal. (Column 4, lines 48-59, where the adaptive algorithm performs the selection of taps based on error signal; Column 14, lines 47-51, where the 3-tap filter has tap coefficients that are symmetrical around a center tap, implying a symmetrical transfer function).

Regarding claim 5, Bliss also discloses a system wherein:

- The transversal filter selectively sets taps coefficients at tap positions that are symmetrical around a center tap according to the polarity of the phase-error signal. (Column 4, lines 48-59, where the adaptive algorithm performs the selection of taps based on error signal; Column 14, lines 47-

50, where the 3 or 5-tap filter implies tap positions that are symmetrical around a center tap).

Regarding claim 6, Bliss also discloses a system wherein:

- There is a conversion table containing table values that correspond to tap coefficients and wherein said transversal filter sets tap coefficients for each tap position by referencing that conversion table. (Column 12, lines 60-63, where the coefficient register file is the conversion table that is referenced for setting the filter tap coefficients).

Regarding claim 10, Bliss discloses a system wherein:

- The phase-detection device is provided with a zero-cross-detection device of detecting the zero-cross of the sample-value series. (Column 8, lines 27-35, where zero phase start circuit 130 of Fig. 4A acts as a zero-cross detector).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bliss in view of Abdesselem et al. (US 6408023), hereafter referred to as Abdesselem.

Regarding claim 7, Bliss discloses all the subject matter claimed (see above), except the setting of coefficients of the taps with respect to their positions in relation to the phase error.

In the same filed of endeavor, however, Abdesselem discloses a method and apparatus for performing equalization comprising:

- A transversal filter sets the tap coefficients to zero for the tap positions that are furthest away from said center tap position when the absolute value of said phase-error signal is greater than a specified threshold value. (Column 3, 10-17, Column 4, lines 53-67 and Column 5, lines 1-15. The transversal filter is an equalizer. The threshold ponderation means 21 in Fig. 1 decides the threshold values depending on the SNR, which in turn depends on the error. The taps that are less than threshold are set to zero. This means that the outer taps may be set to zero, i.e. the taps furthest away from the center tap).

Thus, it would be obvious to a person of ordinary skill in the art to combine the two references as Abdesselem's teachings suggest that selective removal of taps during equalization reduces complexity and performs efficient equalization (Column 4, lines 53-67 and Column 5, lines 1-15).

Regarding claim 8, Bliss discloses all the subject matter claimed (see above), except the range in which the phase error changes and the selective switching of tap connections thereof.

In the same filed of endeavor, however, Abdesselem discloses a method wherein:

- The phase-error signal changes in a range that exceeds one cycle of the clock, and where the transversal filter selectively switches the connection of the plurality of taps according to the change in the phase-error signal.

(Abstract: The assessment means 2 of Fig. 1 assess the tap coefficients generated by the Channel Impulse Response (CIR) estimation means (error detection and correction) and output an assessment signal. An equalizer algorithm-processing unit 5 in Fig.1 is adapted to receive the assessment signal, for selecting and performing one of a plurality of different equalizer algorithms on the basis of the assessment signal, whereby when one or more of the tap coefficients may be disregarded, an algorithm which requires less processing power may be selected and performed in preference to an algorithm which considers all of the coefficients generated by the CIR estimation means 1 of Fig. 1. This implies that when error signal changes in a range that exceeds one cycle, the equalizer algorithm adapts to the changes and switches tap coefficients accordingly).

Thus, it would be obvious to a person of ordinary skill in the art to combine the two references as Abdesselem's teachings suggest that selective switching of taps during equalization, based on phase error changes reduces complexity and performs efficient equalization (Column 4, lines 53-67 and Column 5, lines 1-15).

Regarding claim 9, Bliss discloses all the subject matter claimed (see above), except the range in which the phase error changes and the selective switching of tap connections thereof with respect to tap positions. In the same filed of endeavor, however, Abdesselem discloses a method with selective switching of taps during equalization, based on phase error changes. Abdesselem further discloses:

- A transversal filter with n taps, which selectively connects m adjacent taps ($m < n$) according to the change in the phase-error signal. (Column 5, lines 3-15. The setting of one of the outer edge taps to zero implies that the remaining adjacent taps are selectively connected.)

Thus, it would be obvious to a person of ordinary skill in the art to combine the two references as Abdesselem's teachings suggest that selective removal of taps during equalization reduces complexity and performs efficient equalization (Column 4, lines 53-67 and Column 5, lines 1-15).

Other Prior Art Cited

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.
- Nagano et al. (US 6084907) disclose an adaptive auto equalizer.
 - Shimoda (US 654413) discloses a phase synchronization system.
 - Endres et al. (US 6426972) disclose a reduced complexity equalizer for multi mode signaling.
 - Norris et al. (US 6047073) disclose an audio synthesizer.

Contact Information

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vineeta S. Panwalkar whose telephone number is 571-272-8561. The examiner can normally be reached on M-F 8:30-5:00.
- If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on 571-272-3021. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2631

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

V.P.


MOHAMMED GHAYOUR
SUPERVISORY PATENT EXAMINER